Also inside: BlackBerry Delivers, But Faces a Tough Battle **6** | IT Training Gets an Extreme Makeover **22**

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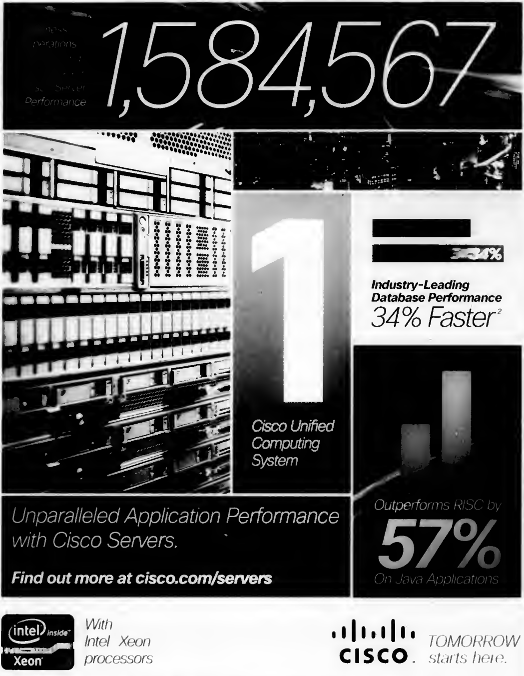
DO *the* MATH

Building a solid business case for your projects means **nailing the financial calculations** and language.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THINKSTOCK

HeadsUp

Diners can use iPads to place orders at OTG restaurants in some airports.

OTG MANAGEMENT

RETAIL AUTOMATION

Restaurant Firm Automates, Adds Staff

OTG MANAGEMENT, which runs restaurants and other concessions in airports, is investing heavily in automation — but it isn't using that as a rationale to reduce its workforce.

The company has deployed iPads in its restaurants in airport terminals that feature a new type of seating arrangement where each seat has a credit card reader. Travelers can place orders using menus on OTG's iPads and then pay their bills using the credit card readers.

They're also welcome to charge their own devices or use the iPads to surf the Web. There's no obligation to buy anything, said Albert Lee, OTG's CTO. It's more important that people have a good experience, he said, adding, "It's that trust that has helped us build out in a successful way."

The company started deploying iPads two years ago in New York's JFK and LaGuardia Airports and now has 1,500 devices in use. It plans to expand the initiative into airports in Minneapolis-St. Paul and Toronto, and by the end of this year, it hopes to have as many as 7,000 tablets in use.

The new tools have reduced the workloads of the wait staffs in OTG's restaurants, so servers have more time to focus on customer service.

Although staff cuts are often one of the goals of automation, Lee says that's just wrong. The iPads and self-help kiosks are "fantastic tools," he said, "but you need a human element to make it really successful."

In fact, instead of cutting staff, OTG plans to hire four iOS developers and an equal number of support staffers.

– Patrick Thibodeau

IT POLITICS

Verizon, AT&T, Google Among Top 10 Lobbyers

Google, AT&T and Verizon Communications were among the top corporate lobbyers of the U.S. government in the fourth quarter of 2012, according to data released recently by the House of Representatives.

In the fourth quarter, Verizon spent $3.48 million, AT&T spent $3.4 million and Google spent $3.35 million, putting them among the top 10 spenders for the period. For its part, Microsoft spent $2.43 million in the same time frame.

Google's lobbying tab for the year was up 70% from 2011, and Facebook's spending in the fourth quarter was up 318% from a year earlier, according to Consumer Watchdog.

The nonprofit consumer advocacy group finds cause for concern in the upward trend. "[Google and Facebook] are following the corrupt tradition in Washington: Buying what you want," said John Simpson, director of Consumer Watchdog's Privacy Project.

Google didn't immediately respond to requests for comment on its lobbying efforts. Verizon and Microsoft refused to comment.

A Facebook spokesperson said the social network's lobbying efforts reflect, among other things, its commitment to "explaining . . . the actions we take to protect the billion-plus people who use our service."

– GRANT GROSS, IDG NEWS SERVICE

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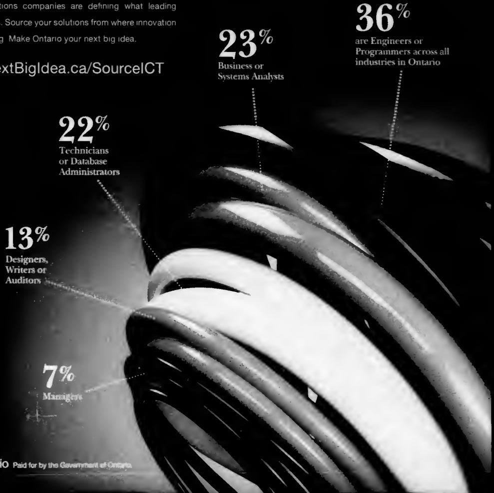

BETWEEN THE LINES
By John Klossner

EMERGING TECHNOLOGY

DNA Could Be Used for Data Storage

RESEARCHERS HAVE created a way to store data in the form of DNA and retrieve it without errors.

The researchers, from the European Bioinformatics Institute (EMBL-EBI) in Hinxton, England, claim to have used such a method to store versions of an MP3 of Martin Luther King Jr.'s "I Have a Dream" speech, along with a JPG photo and several text files.

Their research was published in the journal *Nature* in late January.

"We already know that DNA is a robust way to store information because we can extract it from woolly mammoth bones, which date back tens of thousands of years, and make sense of it," said Nick Goldman, co-author of the EMBL-EBI study. "It's also incredibly small, dense and does not need any power for storage, so shipping and keeping it is easy."

Last fall, Harvard University researchers were able to store 70 billion copies of an HTML-formatted book in DNA binary code.

The difference between the two studies is that EMBL-EBI invented an error-correcting code that was "specially tailored to deal with the types of errors" that both reading and writing DNA tend to make, Goldman said.

Goldman and his co-author, Ewan Birney, associate director of EMBL-EBI, set out to create a code that overcomes both problems. The new method requires synthesizing DNA from the encoded information. The lab worked with Santa Clara, Calif.-based Agilent Technologies, a maker of measurement instruments such as oscilloscopes, to transmit the data and encode it in DNA.

Agilent synthesized hundreds of thousands of pieces of DNA to represent the data, then mailed the sample to EMBL-EBI. There, researchers were able to decode the file.

Goldman's team analyzed the cost-effectiveness of the technology and suggested that, for now, using DNA as a storage medium would be best suited for archival purposes, such as preserving personal photos or videos.

– Lucas Mearian

Micro Burst

Michael Dell and investment firm Silver Lake last week offered

$24.4 billion

to buy Dell Inc. from shareholders.

GOVERNMENT TECH

VA Deploys Sensors to Track Most Equipment

The U.S. Department of Veterans Affairs has begun installing sensors to track anything that costs more than $50. The sensors, which will number in the millions, will be used to manage medical equipment, supplies, specimens and implants – and, eventually, medical personnel and patients.

Hewlett-Packard announced that it has received a $543 million, five-year contract to begin deploying real-time location system (RTLS) technology at VA facilities nationwide. RTLS is an umbrella term for a range of scanning and wireless technologies that include Wi-Fi-based location tracking systems as well as RFID tags.

The goal is to make the VA more efficient in the way it uses supplies, manages inventory and delivers services to patients. Among other things, the system will send alerts if equipment is moved outside a designated area, or if a patient has moved into a restricted area.

The VA will also use the system to monitor the temperature of supplies and determine whether equipment has been sterilized.

The initiative will also include research into new ways to use data generated by such systems, an HP manager said.

– PATRICK THIBODEAU


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A BlackBerry Z10 on display at a Rogers Communications store in Toronto.

BlackBerry Delivers, But Faces Struggle

Two new well-regarded BlackBerry smartphones should help stem the tide of corporate user defections, but it may be too late to win over consumer iPhone and Android users. By Matt Hamblen and Marc Ferranti

THE COMPANY formerly known as RIM delivered on its promise to breathe new life into its aging, iconic BlackBerry product line, but BlackBerry devices still face an uphill battle against Apple's iPhone and myriad smartphones based on Google's Android operating system.

At a New York launch event attended by hundreds of reporters and analysts late last month, CEO Thorsten Heins underscored the plan to reignite his company by first announcing that the vendor had changed its name from Research In Motion to BlackBerry.

The two long-awaited devices introduced at the event — the first smartphones that the struggling Canadian company has unveiled in 18 months — appear to be designed to appeal to two major audiences: consumers and corporate users.

The photo and video capabilities in the new BlackBerry Z10 and Q10 smartphones are likely to appeal to consumers. Enterprise IT managers, meanwhile, will likely welcome the embedded BlackBerry Balance technology, which cao create two separate, secure spaces on the phones — one to hold corporate data and the other for personal files, said Bob O'Donnell, an analyst at IDC.

Heins said the touchscreen Z10 and the Q10 handset with a physical keyboard were designed esseotially from scratch around a new platform based on QNX, a real-time operating system RIM acquired in 2010.

While the BlackBerry was the undisputed leader of the smartphone market for years, the advent of the iPhone and then the rise of Android-based devices led many of its once-loyal users to defect.

The company now has about 80 million users, amounting to less than 5% of the worldwide smartphone market, and it faces an uphill battle when it comes to marketing and selling the Z10 and Qio, even though maoy analysts say the oew devices are a good step forward from previous generations of BlackBerries.

"I think this is definitely a good start, and it will help slow those defections, but many [consumers] in the U.S., for example, have already left," noted Jan Dawson, ao analyst at Ovum. "Most of the remaioing BlackBerry users in the U.S. are on corporate-issued devices, so it's about convincing the IT department to continue with BlackBerry."

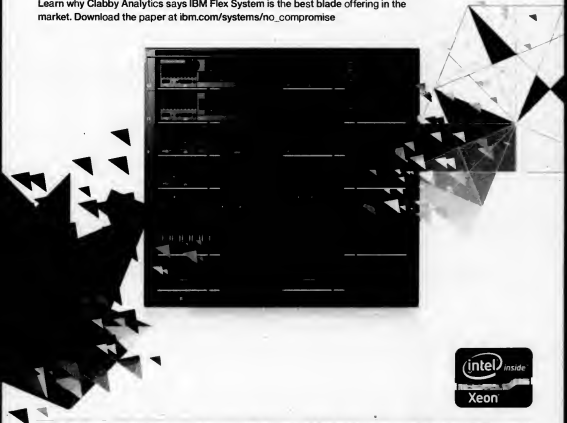
Outside of North Americao corporate IT operations, BlackBerry will run into trouble finding users, Dawson said. "The only big differentiators are productivity-centric, so [the Z10 and Q10 will] help with business users, but not so much with pure consumer users," he said.

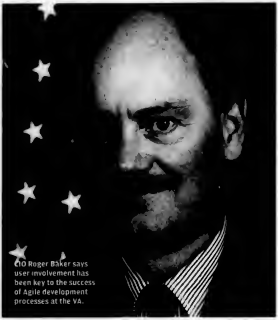
"At best, RIM's new products will allow it to stop the hleeding and hold its market share," said Charles Golvin, an analyst at Forrester Research. "Our consumer data shows that while more than half of U.S. BlackBerry owners plan to get a new phone in the next year, fewer than two in five say it will be another BlackBerry."

BlackBerry said that U.S. sales of the Z10 will begio in March and the Q10 will be available in the U.S. by June. Carriers AT&T, Sprint, Verizon and T-Mohile will announce U.S. prices for the devices before shipments begin. Io Canada, the Z10 started shippiog on Feb. 5 at a price of $149.99 with a three-year contract. ◆

Ferranti *is a reporter for the IDG News Service.* **Martyn Williams** *of the IDG News Service contributed to this story.*

REUTERS/MARK BLINCH





CIO Roger Baker says user involvement has been key to the success of Agile development processes at the VA.

Budget Woes Force Feds to Embrace Agile

Agencies seek new ways to develop software as they face regular shutdown threats and Congress's inability to pass an annual budget. By Patrick Thibodeau

UNPRECEDENTED FEDERAL budget problems are creating a new reality for the software development operations of government IT units.

The days of the big, lumbering, multiyear government IT projects are likely coming to an end as more and more federal IT managers turn to Agile development methodologies to speed up software projects so they can quickly demonstrate the value of new systems.

Government agencies, which spend about $80 billion a year on IT, have regularly faced possible shutdowns and budget cuts in recent years. The latest threat is the so-called sequester, a package of automatic spending cuts that will go into effect next month unless Congress can come up with a long-term plan to reduce the deficit by $1.2 trillion.

On top of that, agencies have been operating on short-term IT budgets since 2010 because lawmakers haven't passed an annual budget.

"This lack of budgetary stability makes it very hard to plan and, I think, extremely hard to plan well," Robert Hale, comptroller and chief financial officer at the U.S. Department of Defense, said last month at the Brookings Institution in Washington.

The uncertainty has forced many government IT managers to seek new ways to develop software, said Kris van Riper, managing director of consulting firm CEB.

"Planning out multiyear projects where you don't see the deliverables for extended time periods in a traditional waterfall method really isn't going to work," said van Riper.

The Agile development methodology's iterative format features short development cycles designed to produce incremental deliverables on an ongoing basis. It emphasizes collaboration among developers, managers and users — anyone with a stake in a project outcome, he said.

"If you can show results sooner and more effectively, the chance that you won't be defunded goes up," said Lawrence Fitzpatrick, president of Computecb, a software services firm.

The Department of Veterans Affairs was a relatively early adopter of the Agile methodology. "We are huge fans of Agile and are using it in our most critical programs," said Roger Baker, the agency's CIO.

Baker says user involvement in the Agile process has been tbe key to the methodology's successful implementation at tbe VA.

"We get the customer deeply involved in the program, defining what the system must do, how it should do it, what the workflow must be, and how the [user interface] should look," Baker said. As a result, "the end users are always happy with the end product. They feel like it's their system, not ours."

> "This lack of budgetary stability makes it very hard to plan and, I think, extremely hard to plan well."

"We hit 80% of our milestones in 2012," he added.

The VA currently has about 200 development projects under way, but it's not yet using Agile in all of them. "I'd insist on Agile in all programs, but I don't think we yet have the breadth of expertise to draw on to do so," Baker said.

Agile was embraced early on by private-sector defense and intelligence contractors, whicb "need to rapidly adapt to new situations," said Bob Payne, a vice president at Agile consulting firm LitheSpeed. In recent years, the methodology has spread to other industries as companies deal with the recession. ◆

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THE Grill

Bill Murphy

Attaining the rank of CIO didn't mean his CTO duties disappeared.

What advice would you give a young IT worker looking to become a CIO? Spend time understanding the business you support, not just the technology. Strive to innovate and deliver value for your business. Don't expect an eight-hour-a-day job.

What's your favorite technology? Smartphones/tablet computers with high-speed Internet. We have only just begun to exploit the possibilities. A monumental change in enterprise computing is under way.

Is there something that most people don't know about you? My first job was as a restaurant cook. My favorite holiday is Thanksgiving – when I do all the cooking.

PHOTOS COURTESY OF HILTON WORLDWIDE

BILL MURPHY *had served as Hilton Worldwide's chief technology officer since early 2012, when in August he was given the title of CIO. But the title change didn't mean he'd be relinquishing his CTO responsibilities. As Murphy describes it, the transition has been a bit of a fire-hose experience so far, with a lot of strategic projects heaped on top of existing duties. Projects include standardization of the hotel chain's property management platform across 3,900 hotels, rollout of a wireless platform and implementation of a PeopleSoft ERP system, which will replace a variety of older tools.*

Why did Hilton decide to give you the added title of CIO? I think culture was an important part of it. And, from a technology standpoint, the hospitality industry is market leading in a lot of ways. You've got sophisticated customers with the latest and greatest mobile technologies who are demanding more and more. Hilton was looking for people who can deliver the technology today and innovate for tomorrow. So they were

The Conrad Concierge app lets guests use mobile devices to customize their accommodations at Hilton's 20 Conrad hotels and resorts.

> **With the advent of the Web, [IT has] been thrust into the forefront of corporate strategies** and not just corporate processing.

looking for very proactive, creative people in those roles.

What is Hilton's mobile strategy, and how is it evolving? It's absolutely evolving. We have recently come out with our latest global Web release and we have mobility apps connected to that, but they're two years old; they're out of date. So we're focusing on that next generation of mobility apps going forward.

We're also focusing on being able to deliver technology to a mobile device as a guest walks into a hotel. And hotel services that used to only be delivered through a concierge, now you will be able to get that through your iPhone. That's what we're working toward. That's one of the targeted initiatives for 2013.

What are some of the other IT initiatives? We just implemented our latest release of our global Web platform. We're continuing to roll that out across the world, with the addition of 13 other languages. [Other projects include] the standardization of our property management platform across our 3,900 hotels, the continued international rollout of our StayConnected wireless platform for all our hotels, and the implementation of our enterprise-wide ERP platform. We're migrating to the PeopleSoft platform from a variety of systems, including earlier generations of PeopleSoft Financials/Sun, internationally.

I do know your choices these days are fewer and fewer, and alignment of Oracle platforms vs. SAP platforms typically [follows] industry lines. Some of the SaaS options just aren't there for your larger enterprises.

What's lacking in software-as-a-service options for the enterprise? Sophistication and the ability to cater to the business and to plug in, in some cases, hundreds of interfaces.

Does Hilton have a bring-your-own-device policy? People have their own devices. You can't stop that from happening. We do have the ability for people to access our network via secure sign-on through effectively any device. We don't have a comprehensive BYOD policy in place. That's one of the things we're going to have to button down in the short term. You're not allowed to have your corporate email on your personal device. Any device that has corporate information on it has to have the ability [to be wiped by the company].

What's the most difficult thing about creating a BYOD strategy? Whatever you decide today, it's going to change tomorrow.

How has the job of an IT manager changed over the past decade, and how has that added to your responsibilities? It's changed significantly in the last 10 or 15 years. Clearly, in the mid '90s, IT was in the back office. It was the engine room of any company. With the advent of the Web, it's been thrust into the forefront of corporate strategies and not just corporate processing. I think it's more fun. You're more instrumental in delivering business value and making critical business decisions involved in business strategy as opposed to just maybe execution.

What are your main concerns about technology? What keeps you up at night? Certainly, security and risk related to cyberattacks. With the sophistication and pluralization of technologies across the board, you're providing opportunities for security threats and risks.

How are you addressing the security threats? By investing in our security infrastructure and taking it very seriously and not closing our eyes to known vulnerabilities in the infrastructure. We've got to address them. If there's an opportunity out there, there will be a breach.

What current or upcoming technology do you see as a game-changer in the data center, and why? Certainly, the question of "In the data center or not?" — the whole idea of how to best utilize cloud computing. More and more of your processing does make sense to have third-party partners provide it via the cloud.

Moving your own data centers to a private cloud also makes sense. We've not done it yet, but that's going to be part of our infrastructure strategy.

– Interview by **Lucas Mearian**

PAUL GLEN

Even if You Can't Measure It, You Must Manage It

There really is no metric for directly measuring the quality of your relationships.

THE OTHER DAY, after speaking to an audience of technical people about the importance of building good relationships at work, a young help desk manager asked, "What metrics should I monitor for that?" I realized that he was trying to reconcile the importance of relationships with a conflicting tenet of his managerial faith that says, "If you can't measure it, you can't manage it."

We geeks love that idea. It meshes with our preference for objectively verifiable facts over squishy subjectivity. We find metrics comforting, having been taught to expect constant feedback on the question "How am I doing?" We get grades on tests and papers. We get scores in video games. We get raises and promotions at work.

But our ardor for this explicit feedback loop can lead us astray. We take it too far, transforming the not-meant-to-be-taken-literally "If you can't measure it, you can't manage it" into the absurd dogma "If you can't measure it, it doesn't matter."

With tbat mantra as our lodestar, we not only ignore hard-to-measure aspects of work such as relationships, but also self-righteously see that approacb as a virtue. You can see this mindset play out in numerous destructive ways. Project leaders become obsessed with tbe process-prescribed approvals while ignoring the mutual trust required to get them. Technical leaders abrasively condescend to users or sponsors, since "they don't get it." Developers adhere to the precise content of a requirements document — as if ticking off 100% of tbe requirements is more important tban making sure the product makes sense — and they end up delivering unusable code.

A more appropriate mantra would be, "Even if you can't measure it, you're still responsible for it." That's because some things, like relationships, are too important to be ignored but too subjective to be measured.

For those important things that metrics can't quantify, you need to use indicators. Indicators are metrics' cousins. Where metrics quantify observable facts that are very closely related to what you want to measure, such as production rates, indicators are less precise and more indirect. They are observable facts, but they can serve only as a proxy to suggest how you're doing on something fundamentally unmeasurable.

For example, there really is no metric for directly measuring the quality of your relationship witb your project sponsor. But there are indirect indicators that help you assess that relationship. You could get a reasonable impression by asking questions such as these:

- Does she respond to my emails?
- Does she show up at our meetings prepared?
- Does she seek my opinion before making important decisions?
- Does she share information with me?
- Does she invite me to meetings that I feel I should attend?

Relationships don't come with dials and dashboards, and only a true geek would need to be told that it would be counterproductive to try to quantify the answers to such questions and plot them on a grapb. Instead, you should use the answers as indicators that can move you closer to sometbing that feels like metrics, but you need to internalize such information and let your gut tell you whether your relationship is healtby or not.

Well-chosen indicators will help you manage the unmeasurable, and that can be immeasurably important. ◆

Paul Glen, CEO of Leading Geeks, is devoted to clarifying the murky world of human emotion for people who gravitate toward concrete thinking. His newest book is *8 Steps to Restoring Client Trust: A Professional's Guide to Managing Client Conflict*. You can contact him at info@leadinggeeks.com.

BUILDING A SOLID BUSINESS CASE FOR A TECH PROJECT MEANS NAILING THE FINANCIAL CALCULATIONS AND LANGUAGE. EXPERIENCED CIOs SAY ROI PREDICTIONS DONE RIGHT CAN PAY OFF. **BY MINDA ZETLIN**

DO *the* + MATH

EVERAL YEARS AGO, Todd S. Coombes proposed a project at a company where he was then CIO. "It was a legacy modernization of some of our older systems and data conversion to the newer platform," he recalls. "It was very important to IT."

But his proposal had to compete against hundreds of other uses of the company's capital, measured against time to payback. "A lot of companies like to do projects if you can get an 18- or 24-month payback," says Coombes, who recently became executive vice president and CIO at ITT Educational Services, a post-secondary educational company based in Carmel, Ind., with 140 campuses around the country. "A lot of these legacy data conversions will have about a seven-year payback, and that's not so great."

BRIAN STAUFFER ILLUSTRATION

The first year that Coombes proposed the project, it was rejected in favor of others with better ROI. The next year, he proposed it again, and again it was rejected. But the third year, he got the go-ahead. What had changed? "In that second year, we had some major, business-impacting outages that were a result of not having done this project," Coombes says. "I explained that it was just the tip of the iceberg of what could happen if we continued not to address things that needed to be addressed just because they didn't match the hurdle rates we were trying to achieve. I think it was eye-opening for a lot of our business counterparts."

Coombes' experience at that former employer illustrates a conundrum for many CIOs: how to accurately project the economic impact of a proposed technology. Net present value, internal rate of return and time to payback are all measurement methods CIOs must understand and use to help business leaders decide whether or not a tech investment is worth making. But many IT leaders lack the financial sophistication to precisely present the information CFOs and CEOs seek. And even if they can, the financial metrics won't work for most IT projects.

"Seventy percent of technology initiatives don't have a direct measurable effect on the bottom line," says Gartner analyst Michael Smith. "Social media is an example of that, as is CRM and, in many cases, knowledge management and collaboration. These all have financial benefits, but they are indirect. Many IT management folks who are asked to project the ROI of items like these find it a very frustrating experience."

Frustrating, yes. Optional, no. Like it or not, especially in these times of constrained financial resources, IT leaders must be able to support essential projects with sound ROI reasoning. Here are some approaches that can help.

Face It: IT Needs Financial Training

All enterprise IT leaders these days recognize the importance of return on investment when deciding which projects to pursue. But few truly understand financial principles, says Peter Weis, CIO at Matson, a Honolulu-based shipping company with $1.6 billion in annual revenue. "It goes back to the traditional career path of an IT manager," he says. "It's easy to move up the ladder on a set of core skills that have nothing to do with corporate finance. For instance, I myself started in software development."

Financial skills are considered a plus, he says, but applicants with core technical skills get hired for executive positions without them. "It's been self-limiting," says Weis. "Finance needs to not be an afterthought. It needs to be as core to your skill set as leadership or IT strategy."

Weis feels so strongly about this that he went back to school to earn an MBA. "In a two-year program, you learn about finance in depth," he says. While Weis doesn't believe every IT leader needs to do that, he says, "It made me much better at corporate finance."

If you don't have and can't acquire that level of financial expertise, make sure someone in your department has it, says Peter Campbell, senior vice president of IT at Sprint-Nextel. "I have MBAs who work in my organization," he says. "I'm not a DBA; I don't know how to fix issues in Oracle, but I have DBAs who can do that. In the same way, I have financial people who can analyze ROI."

Coombes says the best solution is to establish a project management office charged with not only managing projects, but also doing cost-benefit analyses and other ROI calculations. "The PMO has at least initially worked in partnership with finance to create templates for calculating ROI," he says.

Make Friends With Folks in Finance

However much financial training you and your staffers get, you won't be successful until you learn about your own company's particular approach to finance. To do this, get to know your company's financial

Well, Did It Hit the Mark?

ONCE A PROJECT has been evaluated, approved and successfully implemented, you might think you're done with it, but you'd be wrong. "Most IT executives think, 'That one's done; let's get on to the next,'" says Todd S. Coombes, executive vice president and CIO at ITT Educational Services. Instead, it's worth taking the time to go back and ask whether or not projected business benefits actually came to pass.

"In many cases, the answer is no," Coombes says. "But the companies don't know it because they don't take that retrospective view."

Admittedly, "soft" business results can be notoriously hard to measure, and both hard and soft results can be affected by other factors. "For instance, we were supposed to reduce our time to market by implementing product lifecycle management," says Michael Smith, a Gartner analyst. "Sure enough, we cut our time to market in half. But how do we know it was the solution that did that? Maybe the company hired someone who's really good at the job." In addition, business benefits may take a year or more to prove out, so a single retrospective six months after the project's completion probably isn't enough for IT to gauge its full effect.

Easy or not, the more detail you can get about whether or not expected benefits materialized, the better, experts say. And you should share those results, good or bad, with the rest of the company. "At the end of the day, we're all here to do the best we can," Coombes says. "If you're not sharing information in a transparent manner, you're not doing your organization any favors. You need to look at real factual information and use it for the future good of the company."

At Sprint-Nextel, IT project results are published monthly, says Peter Campbell, senior vice president of IT. "We demand a high level of accuracy in forecasting, and any miss is a public miss. We take learnings from the projects where we miss. We have a good process, but it's come from a history of effort and continuous improvement over time."

– MINDA ZETLIN

Telephony Plans and Unified Communications Deployment IN THE ERA OF COLLABORATION

Executive Summary

Physical boundaries are quickly disappearing from today's work world. Many teams are dispersed across time zones with work flowing to talent wherever it is located. Given ubiquitous communications technologies, it is now easy to connect team members in near real time. When presence is shared across communications tools with unified communications (UC), the potential for richer collaboration and more productive teamwork is virtually limitless.

Many organizations have UC implementations in their sights as they update their telecommunications infrastructures. A recent Computerworld survey shows that the prospect of improving efficiency—a top business objective among survey participants—is the top driver for UC implementation.

This survey was conducted to gain insight into how telephony fits into overall business strategy, and to determine UC deployment plans, barriers to deployment and drivers for UC solutions. One hundred and twenty-three respondents from a range of IT titles took part, representing a variety of vertical industries.

Key findings from the survey:

- The majority (70 percent) report telephony is part of overall business strategy at their organizations, rather than a tactical decision.
- Investments in voice solutions other than T1 and analog are expected to increase over the next 12 months.

Why deploy a UC solution?

How is telephony viewed at your organization?

Cost, lack of integration with productivity solutions and complexity are top issues with current enterprise communications solutions that may be causing respondents to evaluate alternatives.

- The potential to improve efficiency (a top business objective over the next 12 months) is the top driver for UC implementation. In fact, among those planning UC implementation over the next year, lack of efficiency is one of the biggest complaints regarding solutions currently in place.
- 38 percent report that a UC solution is in place or being pilot tested at their organizations, while another 36 percent have implementation plans.
- Support for users and executive buy-in are critical to successful end-user adoption of UC, according to those with UC in place or planned.

As an enterprise-ready platform, the Microsoft Lync UC solution reduces or eliminates many of these issues. Lync reduces complexity by allowing users to keep track of their contacts' availability, send IMs, start or join audio, video or Web conferences, or make phone calls—all through a consistent, familiar interface. Lync is built to fully integrate with Microsoft Office productivity applications. Microsoft Lync works on the Windows and Mac platforms, and mobile versions are available for Windows Phone, iOS and Android devices.

For organizations that embrace it, UC will enable them to assemble the right people at the right time to do the work at hand, collaborating across time, geographical and organizational boundaries to boost productivity and efficiency.

For more information, visit
http://lync.microsoft.com

COMPUTERWORLD Custom Solutions Group

Microsoft

Always make sure the numbers are being sourced from whatever department is sponsoring the project. . . . When you start putting out projected benefits without the support of the business sponsor, you put yourself at risk.

PETER CAMPBELL, SENIOR VICE PRESIDENT OF IT, SPRINT-NEXTEL

executives and learn as much as you can from them.

That's what Weis did when he proposed a large, multiyear project at Matson. At the time, Matson was part of Alexander & Baldwin (it has since split off), and Matthew Cox, the company's current CEO, was its CFO. "We were starting a major investment cycle, and I was fortunate enough to spend time with him," Weis says. "I listened closely to the questions he asked — and almost none of them were about technology. They were about risks — what happens to the net present value if the project goes a year longer than expected? Things like that. He saw it as an investment worth tens of millions, and he wanted to make sure it delivered business value. I remember taking copious notes."

For those who haven't had this experience, Weis recommends a direct approach: Simply ask your finance contacts for an honest evaluation of your financial work. "Getting frank feedback as to how well we were doing on our capital requests was very enlightening for me," he says. "I'd had some vague sense that I had to get better at this, but until then, I didn't really know how much there was to it."

Ask About Business Benefits

How much of a business benefit will a new IT project create? Answering that question shouldn't be your job, according to Meade Monger, managing director of the Information Management Services division at AlixPartners, a New York-based consultancy. He says it's foolish for IT to try to judge what the business does and doesn't need. Instead, ROI calculations should be a joint undertaking. "IT brings the information about costs, and business contacts bring the information about business benefits," he says.

"Always make sure the numbers are being sourced from whatever department is sponsoring the project," Campbell says. You should never find yourself saying anything like "This project is going to save you $10 million," he adds. "Are you telling the business that, or are they telling you? When you start putting out projected benefits without the support of the business sponsor, you put yourself at risk."

Use Hard Numbers Whenever You Can

What are the best methods for calculating ROI? A cost-benefit analysis simply compares a project's cost to its anticipated financial benefit. Time to payback measures how long a project will take to pay for itself. Internal rate of return compares a project's anticipated benefits with what the company could have earned on the funds used by simply investing them. Net present value determines how many future dollars are needed for an investment to pay for itself in today's dollars. All of those metrics are meaningful to CFOs, and IT leaders need to use them.

What about the many IT projects that should be done but can't be justified on direct ROI grounds? One approach is to use formulas that attempt to put a dollar value on "soft" benefits. For instance, Gartner offers a system that measures 54 types of benefits and defines the economic impact of each. "It's better than creating fuzzy metrics," Smith says. "Consider things like 'customer intimacy.' If a new technology improves your customer intimacy from 50% to 75%, a CFO will ask, 'How much revenue do we get from that?' Most vendors who come up with those metrics don't know how to answer that question. So those fuzzy metrics can confuse and actually annoy CFOs."

For a "refresh" project such as the legacy migration that Coombes undertook, similar formulas can estimate the cost of not doing the project, both in terms of future maintenance needs and the increased risk of disruption. At Sprint-Nextel, IT asks business units to help create a business risk assessment to measure the potential effect of a failure in a given system. "It's used as a concept for a lot of things, including design requirements," Campbell says. "A high-business-impact system is designed with a lot of redundancies; a low-impact system may not have as many."

When Bad Things Happen to Good ROI Projections

Many IT organizations find it challenging to accurately predict a project's ROI and then fail to achieve the expected benefits when the project is completed. Sometimes this happens because unexpected problems crop up. But in other cases, projects are derailed because the team neglected to prepare for common pitfalls such as these:

1 **"I feel it in my bones." Sometimes IT leaders just "know" that a project is a good idea and decide that assembling the numbers to prove it is a waste of time.** "There's this tendency to view it as a hurdle to get the money because you know at some intuitive level that this is a good investment," says Peter Weis, CIO at Matson. But that's not good enough, he cautions. It's important to learn how to do proper ROI projections, and then do them. "It's not acceptable anymore to assume you'll be forgiven for not knowing finance because you're from IT," he says.

2 **Everything goes under the microscope. There are big projects, there are small projects, and there are projects that aren't optional because they're mandated for such things as regulatory compliance.** It makes no sense to treat them all alike, but some companies do just that, says Matt Wyman, group vice president of IT at Terex Construction & Corporate Apps at Terex Corp.

"If a company tries to put every project into the ROI category, some high-risk problems will have a tendency to fall through the cracks," he says. Replacing aging assets and mandatory compliance projects may be among them. So may projects that are necessary, but small.

"We have three levels of spending, and we put projects in different bins," Wyman adds. "The lesser-cost projects don't go through the same level of scrutiny." It's better to let lower-lever or local managers make these smaller decisions, he adds. "I've seen some companies drive everything, no matter what the dollar amount, through the senior team."

3 **Business units pass the baton. IT tries to please everyone, but sometimes the requests from business leaders don't say much about ROI,** says Michael Smith, an analyst at Gartner. "Someone will say, 'We need social media.' That's describing a technology, not expressing a business need." The IT professional may evaluate some social media solutions and come up with an implementation plan, but everyone will have skipped the step where you project a measurable business benefit – "what the CFO would be interested in," as Smith puts it.

Instead, IT should work with business people and the finance team to come up with a specific, measurable business benefit that the project is expected to deliver. "You can't just stand back like the Wizard of Oz and tell IT to go get the broom from the Wicked Witch of the West," Smith says. "Finance needs to play a coaching role."

– MINDA ZETLIN

Weis, on the other hand, is skeptical of any method of attaching a dollar amount to the risk of a system failure. "If we say it's a million-dollar problem to have an outage in this system, what are the odds of an outage? It might be 0.03%, but you never actually get that percentage. You either get zero or a huge number." So, instead of trying to calculate risk, Weis includes information about such things as the business risk of an outage in his narrative discussion of a project's potential benefits.

"You have to be genuine about it," he adds. At Matson, he says, any threat of business disruption from a failure of an essential system is "as far as the conversation needs to go." But, he cautions, it's important not to raise the specter of a dramatic outage unless it's a genuine possibility. "You have to be fair and reasonable when you make that claim," he says. "And you can't play that card too often."

Do a Sensitivity Analysis

Even if yours is the rare IT department where every project is completed on time and on budget, it's important to complete a so-called sensitivity analysis that details how ROI will be affected if things don't go according to plan.

"You have your base case," Campbell says. "But then how is ROI affected if it costs you 50% more to do the project? If it takes six months longer than anticipated?" Having answers to all those questions ready to go will demonstrate to your finance contacts that you've seriously thought through the possibilities.

Remember: Non-IT Groups Are Also Competing for the Same Funds

"There are always other groups within the company who are also looking for capital investments," Campbell says. "It's something like being in the open market looking for venture capital funding, and trying to convince people that our business case is a good investment of their money."

And that's not a bad thing. "If IT wants to be treated like any other part of the business — and it should — we want to be held to the same level of scrutiny and discipline as other parts of the business," says Matt Wyman, group vice president of IT at Terex Construction & Corporate Apps at Terex Corp., a global manufacturing company in Westport, Conn. "I'd love more money, don't get me wrong. But we're subject to the same financial constraints as the rest of the company."

"It's not that we should be trying to beat out those other projects," Weis adds. "We should help analyze those choices, so that the CFO and CEO make the right decisions for shareholders, and history will judge us as wise for having the right discipline in place." ♦

Zetlin *is a technology writer and co-author of* The Geek Gap: Why Business and Technology Professionals Don't Understand Each Other and Why They Need Each Other to Survive. *Contact her at minda@geekgap.com.*

Green-screen technology creates the illusion that Stormwind's instructors are walking viewers through screen captures and slides.

TRAINING GETS AN EXTREME MAKEOVER

fresh approaches to skills development

FOR JEROME PROVENSAL, IT training hasn't always been a pleasant experience. In fact, "stuck-in-a-classroom training courses taught by semi-inspired instructors of uneven quality" is how Provensal, director of software development at ITG, describes much of his IT education.

The good news, he says, is that dull approaches to training are fast becoming a thing of the past. Instead, more and more companies are granting IT professionals access to simulated environments, cloud-based e-learning modules, high-quality video productions and even Hollywood green-screen technology to earn certifications, upgrade their skills and otherwise advance their careers.

There are a number of variables helping to push staid PowerPoint presentations into history's dustbin. "Innovative IT training programs got their start because of cost-cutting measures," says Kendra Lee, president of the KLA Group, an IT training and consulting firm in Centennial, Colo. As IT managers contend with

PHOTOGRAPHY COURTESY OF STORMWIND

shrinking budgets and skeleton staffs, many can no longer afford to enroll their workers in monthlong, off-site workshops. At the same time, new delivery mechanisms, such as cloud technology, are enabling companies to offer online courses anytime, anywhere, and at a fraction of the cost of on-premises programs.

Also driving innovation in the IT training sector is a new generation of techie. "New grads joining the workforce who have been raised on a diet of Khan Academy-type courses are more likely to embrace the bite-size video model," says Provensal, referring to a popular not-for-profit educational organization and website.

Video Killed the In-person Training Star

Provensal would know. In December 2011, he signed up for Lynda.com, an online training service that's wildly popular among techies because of its hands-on, all-you-can-eat approach. He has viewed videos on everything from Photoshop and WordPress to jQuery and data analysis.

At a starting price of $25 per month, Lynda.com members receive unlimited access to nearly 1,600 courses encompassing more than 85,000 video tutorials. These tutorials, which range in length from one hour to 20 hours, are led by experts in specific disciplines, rather than trainers, and have a decidedly movie-like quality to them. Each video is divided up into 10-minute chapters — bite-size chunks — that allow members to easily search for relevant content, or jump in and out of a training session for a quick SharePoint refresher or MySQL query.

It's a self-directed, piecemeal approach to training that's particularly appealing to today's typically independent, supervision-resistant techies. In fact, since launching its online training service in 2002, Lynda.com has enlisted more than 3,000 corporate clients and more than 2 million individual members. And content is always being refreshed, with nearly eight new courses every week.

"While it's always beneficial to have live instructors that you can ask for help, a lot of IT professionals are very good at teaching themselves," says Lee. "Actually, a lot of them prefer [video-based training]. They just like that environment."

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Comic Relief

Content is also undergoing an extreme makeover in some surprising places. Consider Broadway Bank in San Antonio. In the past, Diana Huntsman, Broadway Bank's vice president and information security officer, had a simple formula for teaching employees not to scribble their passwords on Post-it notes: "pages and pages of materials, a question-and-answer period and PowerPoint."

That was the case until Huntsman began rolling out Digital Defense's SecurED program in late January 2012. SecurED is a series of 12 online training modules that are designed to help companies reduce the risk of security breaches. What makes SecurED different, however, is that Digital Defense partnered with Hollywood actor Fred Willard, of *Best in Show* and *Waiting for Guffman* fame, and Emmy award-winning comedy writer T. Sean Shannon to develop highly entertaining training modules. While there's nothing funny about the topics tackled — physical security, phishing, social engineering — viewers are warmed up with a comedy skit before delving into serious subject matter. As a result, Huntsman says the SecurED program promises to be a pleasant switch from "humdrum" material to "humor that is really going to capture our employees' attention." In fact, Huntsman suspects that SecurED has the potential to become a powerful recruiting tool for the financial institution.

"As the younger workforce comes in, they expect something different from IT training," says Huntsman. "They expect training to be faster and more concise, so I think SecurED is going to be a very good way to accommodate that need."

Educational Experimentation

But for every fresh-faced college grad enamored with training videos, there's an IT professional whose learning style is best suited to hands-on experimentation. Rob Wittes is that type of learner. CareerBuilder's manager of business intelligence development, Wittes recently graduated from the company's Leadership Development Series, a three-year, part-time program that offers training in finance, law, sales and marketing. Whereas traditional training courses are typically taught by in-house personnel, the Leadership Development Series, held in CareerBuilder's Chicago headquarters, is led by professors from institutions like Booth University College and Northwestern University's Kellogg School of Management.

Class size is limited to 30 students, and courses consist of a lecture, lab time and peer review. But it's the program's hands-on approach that makes it unique, says Wittes. Many class exercises involve breaking into groups to create a new product or service, and then devising a strategy for bringing that offering to market as a CareerBuilder competitor.

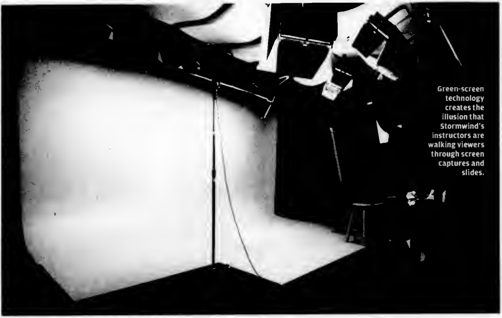
"There isn't a portion of these classes where you don't get hands-on work," says Wittes. "Everything is taught in a collaborative way that gives you exposure to other areas of the company and other employees."

Getting your hands dirty with real-world case studies and marketplace scenarios is critical to any IT professional's continuing education, according to Lee. "The one thing that is most important for IT professionals is to have hands-on time," she says. "Training that is mostly listening just won't work with techies."

Reaching for the Clouds

Providing techies with a crash course in business principles is one thing. Offering them hands-on training in areas such as app development or Web design, however, requires plenty of processing power and valuable IT resources. But cloud computing is changing all that, allowing trainees to experiment without draining IT resources.

"I can teach a class, Ruby on Rails, for example, and people can then deploy their application on the Internet using cloud resources," says Eric Presley, CareerBuilder's CTO. "Training for technology professionals has moved beyond theory. Now they can actually



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"The entire IT department shuts down for a day and allows everyone to hack on any ideas that they want," says Daniel Cosey, CareerBuilder's director of information management. "This includes any training they want to get done — a data inquisition, a new product idea or a new algorithm for our search engine." Here's the best part. The IT professional who presents the most impressive idea wins $10,000 and six weeks of paid work time to implement it.

By embracing self-directed IT training that involves competition among engineers and IT workers, CareerBuilder has created a program that's far more likely to have a lasting impact on participants than standard workshops, says Lee. "If training is entertaining, employees will pay better attention to it and what the message is," she explains.

Obstacles Ahead

Nevertheless, innovations in IT training can carry risks. For example, companies need to make sure that their network infrastructure is capable of delivering training videos across the enterprise. That's something Broadway Bank had to consider when it decided to distribute Digital Defense's SecurED training series across its 40 banking centers throughout the year. "I think we'll have to be careful about how we distribute SecurED," says Huntsman. "Fortunately, one of the things that Digital Defense did early on was put their training modules into the Quicktime format so they won't utilize a lot of bandwidth."

Another pitfall of adopting the latest training methodologies is the risk of attrition. Even if you invest thousands of dollars in training IT employees, there's no guarantee that they'll stick around — especially since the training makes them more marketable. That's a risk companies simply have to accept, says Presley. CareerBuilder does. The company helps IT workers earn MBAs, offering full tuition reimbursements or paid sponsorships — with no strings attached. "If they choose to finish their MBA graduate degree and then, in a month, leave the company, they still don't have to pay that back," says Presley.

But the risk of losing an employee or two doesn't seem to have deterred employers from embracing new approaches to training. Lynda.com reports that 5[illegible] of its members now watch its training videos on smartphones. While that figure might seem small, it has more than doubled over the past year and continues to rise.

It remains to be seen whether it will one day be commonplace for IT professionals to watch training videos starring Hollywood celebrities on smartphones. What is certain is that offering high-quality, creative training via a variety of delivery mechanisms is now a business imperative. ◆

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Tom Graunke, CEO, Stormwind

Behind the Lens of An IT Training Video

Not many people [illegible] training is lon[illegible] "Can you name the last time you did something in e-learning and said it was amazing?" asks Graunke, CEO of Stormwind, an IT training firm in Scottsdale, Ariz. "It's boring, and it's flat."

But the process of looking for ways to breathe new life into IT training tools can itself offer lessons in technology. Take, for example, Stormwind's experience developing its HD Live training system. Used by leading tech vendors such as VMware and Cisco, these live, interactive high-definition IT training videos feature an instructor standing in a control room surrounded by computer monitors. Throughout an hourlong online session, the instructor is seen in front of various screen captures and animated slides while lecturing and fielding questions from audience members in real time.

To make this online learning technology a reality, Stormwind had to find a way to deliver live, high-definition video to a standard Web browser. That's a considerable challenge given that the majority of today's browsers are barely sophisticated enough to handle Flash.

First, Stormwind built a studio with green-screen technology and created software-generated 3D renderings of various backgrounds, to make it look as if instructors are literally walking viewers through screen captures and slides when, in reality, they're just talking to a green wall.

But because typical Internet connections can't support the transmission of green-screen technology, Stormwind had to find a way to compress the massive, high-resolution files. It uses a mix of XML code and Java scripts to deliver the files to Flash media servers, which are designed to stream video to a browser regardless of an end user's device and bandwidth limitations. Essentially, the servers trick the browser into thinking that it's dealing with a single image rather than a hodgepodge of Flash, HTML, green-screen technology and 3D renderings. A Stormwind producer can replace green-screen images on the fly while Flash media servers prompt the browser to refresh 30 times a second for a constant feed of live images.

Instructors are trained in the use of green screens, and a producer is on hand to cue new images and request zooms and studio pans as if producing a live TV show.

Stormwind, which has been in business three years, says it has found that, on average, students retain 92% of the material presented in HD Live training sessions but only 30% of the material presented via traditional online learning channels.

CINDY WAXER

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Behind the Lens

PHOTOGRAPHY COURTESY OF STORMWIND

SOCIAL BUSINESS

Healthcare companies, financial services firms and others are taking advantage of social media, even while awash in rules. Here's how they do it. **BY LINDA MELONE**

TIPTOEING INTO Social Media

SOCIAL NETWORKING is serious business within regulated industries. Posts pertaining to finance, insurance and healthcare, in particular, require adherence to strict government and industry regulations. However, even with the rule-a-palooza, some companies in these industries have not only found ways to keep regulators happy, but have also made social networking a productive and key part of doing business.

That said, the phenomenon is still in fairly early stages. Only around 10% of the companies in regulated industries have a "truly social" enterprise where multiple social media tools have been integrated into general content consumption, according to Toby Ward, founder of Toronto-based Prescient Digital Media, a consulting firm for Fortune 500 companies.

"It depends on the organization and their level of savviness," he says. Companies where executives start their own blogs, for example, are more likely to use social media effectively and adopt it widely, according to a recent study by Prescient. "Almost all major banks have been in social media for at least a few years," Ward says.

THINKSTOCK

Show Me the Regulations

Banks are embracing social media despite the fact that the financial services industry may he subject to the strictest compliance requirements and regulatory mandates. In just one example, in January 2010, the Financial Industry Regulatory Authority (FINRA) published guidelines for blogs and social networking sites that, among other things, outline specific record-keeping responsibilities and supervision requirements.

That hasn't stopped MassMutual, a Springfield, Mass.-based financial services firm, from using social media. "We developed our social media strategy by forging a partnership with key contacts in our company's legal and compliance departments," says Marie Politis, MassMutual's vice president of online experience. "Regulatory requirements are even more stringent when it comes to communications by individual members of our salesforce."

MassMutual is working with Actiance, a Belmont, Calif.-based social media consultancy, to roll out a pilot program that meets FINRA's requirement to review and archive initial, or static, social media posts. ("Static" is a term used by FINRA to describe initial posts; once the audience engages with the content, the resulting conversation is considered "interactive.") Another MassMutual goal for its pilot program is to monitor interactive communications, which must he reviewed.

The benefits of connecting with existing and potential customers through social media make the effort worthwhile, practitioners say. "Money is a highly sensitive topic," says Michelle Peluso, global consumer chief marketing and Internet officer at New York-based Citigroup. "One of the things social media allows us to do is to listen in to hear what people say about our brand, our competitors, our industry, products and services, and our people." Even given all those advantages, though, "we have to think hard about the regulatory challenges," she admits.

When customers have a bad experience with Citi, they may complain about it in the Twitterverse or on a blog. "We don't let the fact that we're a regulated industry dehumanize us," says Peluso, who has a team of customer service reps who are trained to help people who criticize Citi on social media.

"We don't use the same scripted response every time, which you may find with other banks that use a standard answer approved by Legal," she says. "Our reps can use their real 'voices' and personalize a response."

In addition, Citi reps have been trained to move customers off of public feeds and into a private chat environment, where issues can be resolved confidentially and securely.

Social media can also he used for more traditional marketing efforts, such as making sure people are getting the information they need and that the information is accurate, says Peluso.

Rebuilding Trust in Banks

"One current challenge we face is that many people have a deep-seated anger with the banking industry," says Renee Brown, social media director at San Francisco-based Wells Fargo. "Consumers are not trusting us right now." That makes it especially important to engage customers constructively via social media, since many people hit social sites when they have complaints.

But the need to, for example, retain client records for seven years and make sure company reps comply with the rules and regulations can delay efforts to get involved with social media. Wells Fargo partners with consultancies that help make sure the bank meets regulatory requirements and is still "able to interact with customers, clients and potential clients," says Brown.

Wells Fargo's vendors include Hearsay, Socialware and Actiance. "These companies offer software to help with pre- and post-review options to ensure content is appropriately vetted, helping to streamline our internal processes," says Brown.

The two most regulated areas involve broker-dealers. They include investment banking and Wells Fargo's brokerage unit, as well as its home mortgage consultant network, says Brown.

One of the first steps in resolving customer issues is to separate actionable complaints from people who simply want to vent, says Brown. From there, helping customers resolve problems must exclude, by law, giving financial advice via social networks.

"While you may post a note to a friend about an investment, when you are licensed, you can't use certain terms such as *mutual fund* without it triggering the need for a disclosure," says Brown. "We make sure we go through the right compliance reviews before it's posted so nothing gets out there that shouldn't be posted."

This involves the bank's vendors "along with our legal and compliance partners to ensure we have the right oversight in place, but also the ability to be timely in posting and responding on social media channels," Brown says.

We make sure we go through the right compliance reviews before it's posted so nothing gets out there that shouldn't be posted.

RENEE BROWN, SOCIAL MEDIA DIRECTOR, WELLS FARGO

Similar Rules

Insurance industry regulations also require due diligence regarding social media interactions. Generally speaking, these are "the same rules that apply to advertising," says Michele Wingate, social media manager at American Family Insurance in Madison, Wis.

Conversations or interactions posted by agents — or anything on a social network — must be archived in case they are needed for a response to any future legal challenge, Wingate says. To do that, American Family uses social media management software from Shoutlet, a provider of cloud-based social marketing tools.

Wingate admits it can be a challenge. "Our agents are eager to tap into other networks, but in order to comply with regulations, we can only use those for which we're able to archive content," she explains. Currently that list includes Facebook and Twitter, and it may be possible to archive LinkedIn content later this year.

Interestingly, the largest response to an American Family corporate Facebook stream had nothing to do with insurance. Instead, it was tied to the company's "Celebrating and Protecting" social media messaging effort, says Wingate. Conversations about National Chili Dog Day in July garnered more than 1,000 engagements (likes, shares and comments) — a record number, says Wingate. "It was a happy thing, and those interactions kept us top-of-mind," she says.

The Need for Speed

Social media has changed not only the way people interact, but also the speed at which customers expect problems to be solved. "Prior to social media, people wrote snail-mail letters if they had a problem," says Leslie Youngdahl, social media analyst at Consumers Energy's digital care team in Lansing, Mich. "Now, through social media, they expect an immediate response."

Like other utilities, Consumers Energy is regulated by various state agencies, the Federal Energy Regulatory Commission and other entities. The company has a digital team made up of Youngdahl and two other employees who strive to acknowledge customers' remarks within an hour. They do this via a special email account that each team member can access.

The team members also post content on social networks, and when they discover a customer concern, they notify people in the company who can address the matter. "Even if it's two or three people talking about a subject, we always forward it to the appropriate people," says Youngdahl.

A recent social media conversation, for instance, alerted the digital team to a problem with the wording on the company's website that made it difficult for customers to log in. Youngdahl relayed the posts to the company's Web team and IT department and showed them a report on the trending topic and related keywords. The Web and IT teams then made the necessary changes.

"The conversation on that topic died down within a week after we made the change," says Youngdahl.

Consumers Energy primarily uses social media for customer service and to post updates about outages during storms. But as it reaches out to customers via social media, the company must ensure that it protects their privacy. For example, says Youngdahl, a customer might reveal his account number during an online conversation. When that happens, she says, "we delete it immediately and take the conversation offline."

Healthcare: Patient Privacy First

"As a healthcare service, our No. 1 concern is protecting our patients," says Susan Solomon, vice president of marketing and public relations at St. Joseph Health, a 14-hospital healthcare provider serving California, West Texas and Eastern New Mexico. "It's mainly about privacy issues, but there absolutely are ways to stay within the regulations and make social media work. You simply have to set boundaries up front."

St. Joseph's social media goals include reaching out to people to carry on conversations about their health long after they've left the hospital, Solomon says. For example, the subject of a recent St. Joseph Facebook post was, "How do you use superfoods?"

The organization also uses Facebook and Twitter to drive users to a landing page where they can sign up for a newsletter, make an appointment or otherwise securely interact with hospital staffers. For example, a recent breast health campaign included posts on the hospital's Facebook timeline that directed women to a landing page where they could schedule a mammogram.

Physicians also use social media to relay credible information to patients who may be searching the Internet for medical information only to find bad advice from unreliable sources.

That's why Boston Children's Hospital makes sure all of its 60,000 pages of online content goes through a peer-review process, says Margaret Coughlin, senior vice president and chief marketing and communications officer at Boston Children's.

With over 741,000 likes, Boston Children's has the second-highest number of Facebook followers of any children's hospital — St. Jude Children's Research Hospital in Memphis is No. 1.

Coughlin says Boston Children's "got ahead of the curve" by studying the way people choose hospitals and doctors. This involved developing a proprietary model based on primary and secondary research of patients and nonpatients to see how many social media sources they and their families and friends turned to when researching illnesses and healthcare facilities.

The hospital also tracked how people interacted with these information sources. "We wanted to know where and how patients were getting their information and the likelihood of them going back to a certain social media site for information," says Coughlin.

> **We have patients who want their lab test results via Twitter,** which isn't appropriate, but it tells us that people are interested in fast information.
>
> **MARGARET COUGHLIN,** SENIOR VICE PRESIDENT AND CHIEF MARKETING AND COMMUNICATIONS OFFICER, BOSTON CHILDREN'S HOSPITAL

It became clear that word-of-mouth and references from friends and relatives were most important to consumers. "Social networking gives word-of-mouth a whole new meaning, as those friends could include their online friends as well," Coughlin says.

The research also yielded a surprise. Whether a child had cancer or hip pain, the number of sources searched was not that different, says Coughlin. "This made us realize we needed to expand the information we provide to patients in as many social media platforms as possible."

Interestingly, some patients aren't concerned with their own privacy. "We have patients who want their lab test results via Twitter, which isn't appropriate," Coughlin says, "but it tells us that people are interested in fast information." In response, the hospital created a secure portal called MyChildren, where patients can get their lab results and other information.

As for employee social networking rules, no one outside of Coughlin's department is allowed to blog as a representative of Boston Children's Hospital. And no employees can dispense medical advice via social media, although general information and links to helpful sites is fine.

When social media first came on the scene, some executives at companies in regulated industries resisted, in what Prescient's Ward calls a knee-jerk reaction to new technology. But with a few precautions, these companies can engage, connect and converse with customers as effectively as organizations in any other sector. ◆

Melone *is a freelance writer based in Orange County, Calif. She specializes in consumer topics ranging from health to technology and business. Contact her at Linda@LindaMelone.com.*

Security Manager's Journal

MATHIAS THURMAN

Trouble Ticket

Did DLP Tool Prevent an Assault?

THE PLAIN VIEW DOCTRINE allows law enforcement officials to seize, without a search warrant, evidence or contraband perceptible during a lawful observation. As an example, if a police officer who is exercising a warrant to search a house for illegal weapons sees drugs on the kitchen counter, in plain sight, then the officer can confiscate the illegal drugs and charges could be filed, even though the search was for weapons.

I mention this doctrine because it intersects to a certain extent with a company policy that states that employees have no expectation of privacy when using company computers and networks. We are basically saying that we will judge anything on them as being in plain view.

the discussions about security! **computerworld.com/blogs/security**

This policy is what allows my analysts to monitor network activity for security breaches and other illegal activity. Naturally, we are mostly interested in detecting attempts to leak any sensitive company information. To that end, we have indexed a fairly small set of key documents for our data loss prevention (DLP) tool to look for. But we also look for certain number sequences and keywords suggesting credit card numbers, Social Security numbers or other personally identifiable information, and we look for keywords that might indicate illegal activity such as downloading child pornography. That's because we don't want to be surprised someday with a search warrant that could disrupt our business and result in some bad press for us. It's better to be on top of such things and alert law enforcement anytime we come across anything suspicious.

And sometimes we do find something. The other day, one of my analysts sent me data he was investigating that suggested someone in the company might be involved with child pornography. Our DLP monitor had flagged some traffic containing keywords that we had included in the rules we use to turn up anything that might be related to such activity. Soon enough, we found out that this wasn't a child pornography case, but something else that we needed to bring to the attention of law enforcement.

The analyst had uncovered an instant-messaging chat between one of our employees and someone from outside the company. The chat rather baldly outlined a conspiracy between the two men to assault a third man that our employee suspected was having an affair with his wife. In that conversation, our employee discussed a plan to use his wife's cellphone to text the man and persuade him to visit a park for what he thought would be a meeting with the employee's wife. At the appointed time and place, the two conspirators would attack him.

Incriminating Details

The discussion was incredibly detailed and incriminating: They talked about the type of weapon that would be best for the attack, their alibis and even the best way to wash blood off clothing and hands.

I printed out a transcript, along with information about the employee, and met with our legal department and human resources. HR's impulse was to give the employee the benefit of doubt, but our general counsel, concerned that we could be charged with negligence if an assault occurred, disagreed and said we needed to contact law enforcement immediately. I then told the employee's manager to confiscate his laptop until the matter is resolved.

I checked in the other day to find out what is happening and learned that the police investigation is ongoing and that HR has put the employee on administrative leave. There is still a chance that the entire thing was a hoax, but the incident nonetheless provides further justification for our investment in DLP.

All in all, though, I'd be happier with other sorts of justification for such a valuable initiative. ◆

This incident provides further justification for our investment in DLP.

*This week's journal is written by a real security manager, **"Mathias Thurman,"** whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*


EXCLUSIVE
ACCESS

OPINION

PRESTON GRALLA

Does Hardware Still Matter?

Today, expensive, high-powered machines feel as outdated as V-8 muscle cars.

THERE WAS A TIME when the launch of a new generation of PCs was a major event in the tech world. Home users could barely wait to put the new hardware through its paces, and enterprises planned their architecture and budgets around the new gear.

Those days are long gone. Today, hardware is often an afterthought in the enterprise and likely to be driven as much by employees' preferences as by centralized IT planning. Expensive, high-powered machines feel as outdated as V-8 muscle cars. In a world where computing is often done in the cloud, or else in short, data-intensive bursts on mobile devices, hardware simply doesn't matter much. This has significant implications not just for hardware makers, but for Microsoft, Google, Apple and Amazon as well.

In the days of muscle machines, Microsoft had an operating system monopoly. Today, tablets and smartphones are often used for tasks that PCs once performed, and when you take those devices into account, Microsoft has become an also-ran. A Goldman Sachs report says that if you combine traditional computers, tablets and smartphones, Microsoft has a 20% operating system market share, with Google at 42% and Apple at 24%.

A Gartner report recently concluded that tablets will soon be people's main computing devices, with PCs used only secondarily. That's backed up by a report by DisplaySearch, which says that this year, tablets will outsell notebooks by a wide margin — more than 240 million tablets versus 207 million notebooks.

Who are the winners and losers? Google is the biggest winner today, and will be even more so tomorrow. It makes money from ads, served up not just during searches, but also in Google services such as Gmail and Google Maps. Android is likely to continue to outsell the competition, which means more users, more market share and more revenue.

There are signs that Google may also expand in the notebook market with its Chromebooks. Acer President Jim Wong, who described the Windows 8 launch as "not successful," touts his company's Chromebooks. He says they account for 5% to 10% of Acer's U.S. sales, and he's considering selling them in other developed markets. Chromebooks aren't powerful pieces of hardware — they're stripped down and basic. But for anyone who has embraced Internet-based computing, they're a steal at $199.

Another big winner will be Amazon. The more cheap devices with Internet access in use, the more people will buy online.

Microsoft is clearly the biggest loser. Its plunging market share and inability to break into mobile in a serious way could lead to a low-growth future dependent on big-ticket corporate sales with little or no traction in the lucrative consumer market.

Apple is a potential big loser as well. All but its staunchest fans may grow weary of paying a premium for a Mac when they can buy a cheap Chromebook that will do whatever they need in an always-connected world. And although Apple is the leader in tablets and has a big share of the smartphone market, it's not clear how long that will continue. Low-cost Android tablets have eaten into its market share. Orders for iPhone displays are said to be about half of what Apple had planned for the upcoming quarter.

Apple's revenue is largely based on hardware sales. If those decline, the company will be in jeopardy.

So get ready for a sleek new world, devoid of hardware screamers and less and less dominated by Microsoft and Apple. ◆

Preston Gralla is a *Computerworld.com* contributing editor and the author of more than 35 books, including *How the Internet Works* (Que, 2006).

Career Watch

ASK A PREMIER 100 IT LEADER

Dave Ballai

The CIO at Reed Technology & Information Services answers questions on **promising directions for an IT career.**

I recently earned a bachelor's degree in computer science. What technology area looks most promising for the future? First, congratulations on investing the time to earn that degree. It is such an important and relevant credential in building your career.

Among many white-hot areas, the one I find most promising is the tremendous push into analytics-driven decision-making generated by the ever-growing availability of big data. Today, we all work in content-rich environments where information sets of almost endless combinations are being developed to deliver strategic value. This suggests a strong need for data scientists, developers, analysts and related technologists who can help organizations build and work with analytics-driven tools.

Of the many other options, one involves a persistently evolving and mission-critical challenge for government and commercial entities: the delivery of high levels of system and data security. We've all seen bad behavior in system intrusions and the effect of that activity, and the problem is unfortunately only growing. This suggests that information and system security professionals will continue to be in demand for many years to come.

After more than 20 years in software development, I think it might be time to move on. What are the hottest areas in IT these days? Twenty years in software development is quite an accomplishment! This suggests that you've watched the evolution of technology and have contributed in ways that should now offer you a very strong method to evaluate your options.

Answering your question requires a bit of understanding of the range of your software-centered skills, so my first reaction is to suggest that you likely already have an answer to the question based on what you enjoy most. I'm inclined to think that the answer to your question should start with an evaluation of your passions first and how they align with real or perceived hot technology areas. While there are plenty of articles emphasizing trends in BYOD, security, predictive analytics, SharePoint, cloud computing, social networking and many more, take the time to consider your interests first. By way of example, in my work with CIOs in the technology community, I'm often asked to help those in transition. The conversation typically starts by asking, "If you could work anywhere or for anyone, where or who might that be?" We then discuss how to move toward that objective. In your case, you should decide whether you're pursuing a technology simply because it's the current fad or because you can really see yourself working with it for the next 20 years.

[illegible] **askaleader@computerworld.com,** [illegible]

New-Job Remorse

IF YOU HAVE TAKEN A NEW JOB ONLY TO FEEL within weeks or months that you weren't given a realistic picture of what you would be doing in it, you aren't alone. In a recent survey of new hires, only 51% of the respondents said that they feel very confident that they made the right decision in accepting the job. However, these survey results indicate that they did have high levels of satisfaction in other areas:

I am satisfied with my job.	84%
I find personal meaning and fulfillment in my work	80%
I feel a sense of loyalty to the organization	83%

The factor in the hiring process that new hires most often took issue with was the failure to provide an accurate impression of the job, followed by efficiency.

Here are the percentages of new hires who described the hiring process as highly or very highly . . .

Favorable	87%
Professional	87%
Fair	84%
Thorough	80%
Effective	78%
Efficient	72%
Realistic	70%

SOURCE: DEVELOPMENT DIMENSIONS INTERNATIONAL'S 2012 SURVEY OF 2,372 NEW HIRES, 1,764 OF WHOM WERE LOCATED IN THE U.S., WITH THE REST SCATTERED AMONG 27 OTHER COUNTRIES

ISTOCKPHOTO

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below.

User Interface Designer (Mountain View, CA) **#1615.5075** Define the user model and user interface for new and existing Google products and features. Exp incl graphic design, branding, iconography; typographic layout; color; composition, interaction design; web & mobile design prototyping; asset production; QA, research; & sw design tools

SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects. Exp incl:

#1615.4033 sw dvlpmnt & design; syst arch; embed syst dvlpmnt; consumer electronics; debug; & Java, C &/or C++

#1615.3544, appl-level vulnerability test., code-lvl security audit, web technologies & protocols, web appl security technologies, & security engineering, computer & ntwrk security authentication security protocols, & applied cryptography

#1615.1192 large-scale distrib syst, oo program lang & design reviews

#1615.1747 Java, C, C++, Python, Haskell, & SQL, appl program interface design, production syst monitoring, release, & debug, adv concurrent algorithms, oper syst, ntwrk infrastruct, multithread design & test dvlpmnt

#1615.815 C & C++ in large-scale data index & mach learn for info extraction

#1615.3653 large-scale data process & analysis using data mine, statistical model, mach learn, & algorithms, C, C++, &/or Java, sw design, data struct, distrib syst & parallel & distrib compute & Python, Perl &/or Shell

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below.

Quantitative Analyst (Mountain View, CA) **#1615.4459**: Research methods for improving Google technology. Exp incl analytical business consult, stat data analysis; regression models; optimization methods, incl linear, non-linear, multi-criteria, & dynamic prog; optimal prod pricing; data mine; supply chain & replenishment optimization; demand forecasting; large scale datasets, incl data validation, write queries, & data visualization, & SQL

Site Reliability Engineer (Mountain View, CA) **#1615.4238**: Provide technical support necessary to ensure full availability of Google online services. Exp incl: Linux internals; Unix daemons; TCP/IP ntwrkng, & scripting with Bash or Python.

UX Creative Lead (Mountain View, CA) **#1615.2996** Lead design initiatives for Google commercial projects. Exp incl: site analysis, Photoshop & Illustrator; Maya, Python & ZBrush, WebGL shaders & C++. Up to 15% trvl req'd

SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects. Exp incl.

#1615.1976, C++, Perl, Python, or other interpreted lang, standard template libraries, algorithms & data struct, multithread, design distrib compute algorithms, mach learn, & hw design & energy efficiency

#1615.3391, design of basic data struct & algorithms, data process in distrib syst, large-scale database oper, UI web dvlpmnt w/HTML, CSS,& Jscript, & dvlpr tools.

#1615.2344 C &/or C++, Java, Python, & Jscript, POSIX prog, dvlpmnt & deployment of large-scale distrib syst, & concurrency, multithread, & synchronization

#1615.1784 IGPs, BGP, C/DWDM optical transport syst; design & implement networked sw syst using C, C++ or domain specific lang, design & dvlpmnt of ext to routing protocols, & analysis & synthesis of quantitative ntwrk measurements. Must have authored at least one peer-reviewed publication in the computer networking field

#1615.839: Syst-level sw dvlpmnt in C or C++, Python or Shell prog, Unix or Linux dvlpmnt, multithread prog using pthreads or GLib, & usage & dvlpmnt of ntwrkng components

#1615.1140, Distrib syst, incl data mining, fault tolerance, & distrib databases, Computer Ntwrks & ntwrk prog, TCP/IP & HTTP protocols, AI, incl info retrieval & machine learn, algorithm design & analysis; databases, incl RDBMS, Python, C++, & Java, Web Prog technology, & Unix & Linux

Position:
Lead Programmer Analyst
Job Design develop test, optimize enhance & implement efficient technology based solutions with the objective to improve productivity using Oracle EBS R12, SQL, PLSQL, Oracle Rpts Developer 6i/ 10g, Oracle Forms Developer 6i, SQL Developer, Quest TOAD, XML Publisher, Oracle Workflow Builder, HP Mercury Quality Center Test Director, UNIX, JAVA, Shell Scripts, Oracle Discoverer 10g, WinSCP, Putty & Microsoft Office (MS Word, MS Excel, MS PowerPoint and MS Visio). Analyze user needs, gather system requirements & develop software solutions using scientific analysis and mathematical models to predict & measure outcome & consequences of design. Creates test scenarios, performs Unit and Integration testing & help the users in performing UAT. Develop various documents as per Oracle AIM standards. Provides immediate solutions to critical production support issues. Provide guidance and training to less exp IT staff & key users.
Required Master's Degree in Computer Science or Engineering and two years experience in the job offered
Hours Monday - Friday, 8:00 am to 5:00 pm - 40 hrs/week
Location Boca Raton, FL
Contact: Send resumes to Hollander Home Fashions, Rose Ruiz, Director of HR, via email to rruiz@hollander.com. Refer to job code "LPA/km" when applying. EOE

SoftPros, Inc. seeks qualified Information Tech Research Scientist, etc. with verifiable exp to study & evaluate alternative models of turning rjobcafe.com into a profit center through an open source worldwide usage using VB, OpenGL, Silverlight, WCF, AJAX, XAML, Generics, IAsyncResult Design Pattern, Event-Based Asychronous Design Pattern etc. to work in Atlanta, GA & unanticipated locations nationwide. Masters deg or equiv in CS or Engg or Elect. Engg or rel field & nec travel reqd. Bachelor's deg & 5 yrs exp in lieu of a Master's deg in applicable fields acceptable. Send only resumes to 4470 Chamblee Dunwoody Road, Ste 230, Atlanta, GA 30338-6224 (EOE)

Sr Software Engineer - Work Location - (Plano, TX) Plan design develop, test, enhance & co-ordinate activities to implement adv s/w module components in complex computer environments. Consult with users & mngmnt to assess computing needs & system requirements. Perform unit tests & prepare test cases for defect tracking to improve s/t quality using C, C++, UNIX, Micro Controllers & Intel based Processors, Linux etc. Apply w/2 copies of resume to HR, Adroit Infotech, Inc 3400 Silverstone Dr., Ste#133, Plano, TX - 75023

Computer Professionals for (Secaucus, NJ) IT firm JR LEVEL POSITIONS: Programmer Analysts, Software Engineers, Business Analysts, Quality Assurance Analysts, to develop, create & modify general comp applications s/w or specialized utility programs analyze user needs & develop s/w solutions, test the application. Jr level positions require Bachelors degree/Bachelors with 1 year/ Bachelors with 2 years of experience in the related field. Some positions require to travel and relocate. SR LEVEL POSITIONS Sr S/w Eng, Sr Programmer Analysts, Sr Business Analysts, Sr QA Analysts, Sr Data Base Analyst, Sr Network Administrators to plan, direct, coordinate, test and implement activities in such fields as electronic data processing, information systems, systems analysis, businessanalysis & comp programming. Develop and direct software system testing and validation procedures, programming, and documentation. Design, develop and modify software systems using scientific analysis and mathematical models to predict and measure outcome and consequences of design. Sr level positionsrequire Bachelors† degree with 5 years of exp or Masters degree/ Masters +1 year of experience in the related field. Some positions require to travel and relocate. Apply w/2 copies of resume to H.R.D., Microexcel Inc., One Harmon Plaza 10th floor, Secaucus, NJ 07094

Sr Programmer Analysts (Atlanta, GA) Dvlp &write computer prgms to store, locate & retrieve specific documents, data, & information. Dsgn & implmt the next generation IP platforms usingtools & s/ware with backend d/bases to provide an integrated mgmt system. Convert project specifications & statements of problems & procedures to detailed logical flow charts for coding into computer language. Any suitable combo of edu & exp equal to Masters is acceptable. Will also accept any-combo of edu equal to Bachelors plus 5 yrs of related exp. Major field of study in Comp. Sci. Engg (any), Science (any), Applied Electronics is reqd. Mon thru Fri 9a-5p. Offers standard employment benefits. Apply w/ 2 copies of resume. Polar IT Services Inc. 3783 Presidential Pkwy, Ste 124 Atlanta, GA 30340

Interested candidates send resume to Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below.

Software Engineer (San Francisco, CA) **#1615.1062** Design, develop, modify and/or test software needed for various Google projects. Exp incl oper syst & multithread program; algorithms, compiler & program lang Python & Java, program lang incl C, C++, & Bash, unit test, load test & end-to-end test, & large &/or distrib syst.

IT|careers

Interested candidates send resuma to Google Inc. PO Box 26184 San Francisco, CA 94126 attn Lisa Harrington Please reference job # below

Test Engineer Positions (Mountain View, CA): Design, develop, modify, and/or test software needed for various Google projects Exp incl
#1615.4757. Java & Jscript, Selenium & WebDriver: Linux, Windows browsers, ntwrkng protocols & UI test Internet standards & ntwrkng protocols, mobile testing with Android iOS native appl & mobile browsers dvlpmnt & leadership of automation efforts & generation of scripts to perf automated testing cycles, automated functional testing & product end-to-end testing, & fast track Agile dvlpmnt process
#1615.4077, C, C++ and Java Jscript, Python, Java & CPP dvlpmnt of test frmwrks & UNIX/Linux
Developer Programs Engineer (Mountain View, CA). **#1615.5258** Work to increase market acceptance of Google developer products Exp incl mobile appl dvlpmnt, Android APIs Java API design C & C++, REST, XML, HTTP, or HTML, Linux Bash Perl or Python client-srvr dvlpmnt; & arch design for large syst Exp to incl one year with an API for bldg online games on a social ntwrk prod
Technical Solutions Engineer (Mountain View, CA) **#1615.3405** Develop innovative solutions to help drive revenue and make Google sales most efficient Exp incl UNIX syst, Java program, incl core libraries & design patterns web dvlpmnt, HTML, XML, Jscript, AJAX & SSL, & AI, incl stats & mach learn
Associate Product Manager (Mountain View, CA) **#1615.716** responsibility for Google products from conception to launch Exp incl mach learn probabilities & stats analysis, creation of prod requirement docs incl data-backed analysis & insights, internet-based web appl UI design & creation of wireframe & mock ups for prod UI, & internet-based monetization techniques incl fundamentals of auction-based advertising systems Exp to incl completion of 5 grad-level courses involving comp program
SW Eng Positions (Mountain View, CA) Design develop, modify, and/or test software needed for various Google projects. Exp incl:
#1615.5400, mach learn linear algebra, probability & stats, design & implement large scale distrib syst bldng of highly scalable performant solutions MapReduce, algorithms & data struct, C++ multi-thread, STL, Java, & Python
#1615.4472; C, C++ & script lang, incl Python, Perl, Shell Scripting oper syst incl Linux & Unix, adv data struct & algorithms & graph algorithms oo design, test driven dvlpmnt & design patterns perf analysis & optimization of sw syst sw process & test automation, multi tiered web svc arch web search runtime (query processing) & index syst, DFS, MapReduce, BigTable or HBase, ZooKeeper: RESTful web svc (incl apache, OAuth, HTTP json); massive parallel & distrib system s architectural tradeoff analysis & event driven near real time stream process syst, incl Storm
#1615.5151; dvlpmnt in srvr-side technologies incl C, C++ &/or Java, AJAX, HTML, & CSS, interface design, & web appl dvlpmnt.
#1615.500 web program w/HTML, CSS & Jscript multithread, concurrent, & distrib program, design patterns, complex algorithms, data struct, large-scale web syst, & dvlpmnt of social ntwrk prod

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Software Engineer in Test (San Bruno,CA) **#1615.3771** Design, develop, modify, and/or test software needed for various Google projects. Exp incl algorithms, design patterns, test automation, C & C++; Java, Shell Linux, & Android

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SW Engineer Position (Venice CA) **#1615.1634** Design, develop, modify, and/or test sw needed for various Google projects Exp incl large scale system design, C, C++, Java, or Python dvlpmnt, test, & enhancement of prod &/or syst utilities, data struct, algorithma, & sw design, database dasign, SQL, &/or knowledge of TCP & IP & ntwrk program, & HTML standards

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Information Security Engineer (Mountain View, CA); **#1615.284** Design, develop, modify, and/or test Google's information security systems. Exp incl: C &/or C++, Java, Python and Javascript; dvlpmnt & deployment of authentication & authorization syst, incl industry standard protocols (OAuth, OpenID and SAML); security vulnerability research, dvlpmnt, & mitigation, incl cryptography & syst level audit & exploitation, & mgmnt & dvlpmnt of large distrib syst.
SW Eng Positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects Exp incl
#1615.456 distributed syst, parallel & distrib program, incl parallelism patterns, web dvlpmnt in MVC model, Java, and message-oriented middleware

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Software Engineer; Chicago, IL. #1615.1933. Design, develop, modify and/or test software needed for various Google projects. Exp incl: C, C++ & Java, Python &/or Jscript AJAX. Unix &/or Linux; database design & SQL, TCP/IP & ntwrk prog, data struct, algorithms, & sw design; serving syst for search &/or info retrieval; ranking over large scale dataset; dvlpmnt & exec of side-by-side experiments for improvement of search quality; distrib computing syst & large-scale data process using Map Reduce technologies, & mach learn algorithms

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Technical Solutions Engineer (San Francisco, CA) #1615.773. Analyze Google user requirements, procedures and problems to automate or improve systems. Exp incl: Java, C++ & Python, Jscript; large scale distrib syst, sw eng'g patterns, relational & non-relational databases, & integration & load tests

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Site Reliability Engineer Positions (NY, NY) Provide technical support necessary to ensure full availability of Google online services. Exp incl:
#1615.2862 mgmnt of large scale distrib databases & file syst; design & dvlpmnt of syst & methods to configure, maintain, & monitor syst; Python, C++; & troubleshoot perf & stability issues across the sw stack, incl hw prob, TCP/IP ntwrkng, load balancing, corruption, resource exhaust, memory leaks, concurrent compute, logic errors, & unexpected user behavior.
#1615.2834 Unix, Linux &/or Windows; Python, C, C++, Java, Perl, Shell or PHP; tech troubleshoot & perf tuning
SW Eng Position (NY, NY) Design, develop, modify and/or test sw needed for various Google projects. Exp incl:
#1615.3727 approx algorithms; AI & pattern recognition; practical syst dvlpmnt, computer arch & real-time oper syst, oo prog & multi-thread syst, C++ & Java; convex & dynamic prog, & prod plan, dvlpmnt & launch.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
Software Engineer in Test (Kirkland, WA) #1615.4513 Design, develop, modify and/or test software needed for various Google projects. Exp incl: ntwrk protocols, automated test syst & research on system design
Software Engineer Positions (Kirkland, WA) Design, develop, modify, and/or test sw needed for various Google projects. Exp incl:

#1615.3787 algorithms, data struct, sw design patterns, design & dvlpmnt of frontend techn using Java, HTML, CSS, AJAX, & XML, web-appl backend tech, C++, multi-thread prog perf monitor syst dvlpmnt, & web srvcs & appl servers
#1615.4271 C & C++; algorithms, multithread & oo design & dvlpmnt.

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SW Eng Position (NY, NY) Design, develop, modify, and/or test sw needed for various Google projects. Exp incl:
#1615.5397 Java; multi-thread prog, design patterns, large scale distrib syst, API design & dvlpmnt, & dependency injection.
#1615.3565 sw eng'g on quantitative proj; dvlpmnt of syst that perf data analysis of large vol of data using tools, dvlpmnt of low latency syst (<10ms response time) realtime mrkts, & dvlpmnt of syst that are critical to business in terms of oper, profitability, & competitiveness

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
Test Engineer Positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp incl:
#1615.5432 design & prog test automation & test harnesses for various sw appl; oo lang; test & debug appl & data analysis & creation of reports to analyze & guide dvlpmnt of sw proj
#1615.563 dvlpmnt &/or test automation, analysis & decomposition of complex sw systems, test harnesses & infrastruct; Java & Jscript & debug issues & identify root causes.
User Interface Designer (Mountain View, CA) #1615.4996 Define the user model and user interface for new and existing Google products and features. Exp incl: Adobe Photoshop, Illustrator, Dreamweaver, After Effects, Acrobat, OmniGraffle, & Flash, Microsoft Office sw, creation of prototypes with Jscript, jQuery &/or Hype, HTML5 & CSS3
SW Eng Positions (Mountain View, CA) Design, develop, modify and/or test software needed for various Google projects. Exp incl:
#1615.629, info retrieval design & implement retrieval syst; analyze retrieval syst, computer vision & image process algorithms, pattern & image recognition, & implement algorithms for different pltfrms
#1615.1735 C or C++, Java, Jscript, HTML, CSS, AJAX, UI design, data mine, high scalability appl, mobile oper syst & distrib computation on mobile devices
#1615.2918, ntwrkng sw syst design, ntwrk protocol design, prog in C++, C, Python, & Java; data struct; algorithms, multithread prog, statistics, Linux Kernel & benchmark perf eval
#1615.4632, C & C++, oo design & dvlpmnt, Python or Perl, sw design & dvlpmnt; Unix & Linux, data struct; & algorithm dvlpmnt for large scale data analysis, data mine, & mach learn
#1615.4795 appl-server pltfrm, mgmnt syst & interfaces, fault-tolerance syst, Java & C++, distrib syst design & RPC protocols, data serialization & exchange formats, Java Servlet API specs & HTTP/1.x wire protocols & semantics for production environ
#1615.4247 prog in C &/or C++, Python & Jscript, mach learn, text understanding, video process, data mine; distrib compute & large-scale data process
#1615.3609, C, C++, & Objective-C, algorithms, multithread appl on mobile devices; oo design & arch, optimization & perf issues on mobile devices, & iOS application dvlpmnt & OpenGL & location based srvcs
#1615.4280, C++ or Java, large syst sw design & dvlpmnt, Linux, data struct, adv algorithms, eng'g tools, specifically eclipse & perforce, info retrieval & data mining, & large-scale distrib design & data process
#1615.3600 design, implement, test, & maint of complex sw, dvlpmnt, test, & enhancement of prod & syst utilities, algorithms sw eng'g; C++, & SQL

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Software Engineer in Test (Mountain View, CA) #1615.3497 Design, develop, modify, and/or test software needed for various Google projects. Exp incl: sw dvlpmnt; Java; data struct & algorithms; oo design; & distrib compute; sw test; & test automation.
Network Engineer (Mountain View, CA) #1615.4006 Identify issues for Google's networks and determine appropriate solutions. Exp incl: internet routing protocols, specifically BGP, MPLS-TE, QoS, CoS, & IS-IS; router pltfrms, specifically w/Cisco & Juniper T/MX/EX pltfrms; ntwrk analyses & troubleshoot large scale & complex ntwrks, large scale IP ntwrks & CDN ntwrk; eng'g of traffic using BGP & large scale ntwrk design & maint; ntwrk plan methods, specifically ntwrk optimization, simulation, & decision analysis; & Python, Unix, & shell script
Business Systems Integrator (Mountain View, CA) #1615.5490 Design analytical solutions that answer complex business decisions. Exp incl: design & dvlpmnt of appl in Hyperion Planning & Hyperion Essbase; finance & acct processes, script & prog lang, SQL & SQL relational data model & ETL tools, specifically ODI.
SW Eng Positions (Mountain View, CA) Design, develop, modify and/or test sw needed for various Google projects. Exp incl:
#1615.3522 .Net pltfrm, incl C# & Windows pltfrms; client-side technologies, incl Jscript, HTML, & Android pltfrm; web appl security; API design; oo principles, incl encapsulation, abstraction, inheritance & polymorphism; dependency injection, inversion of control & aspect oriented prog; unit test & unit test frmwrks, incl MsTests & Moq; continuous integration syst; dynamic lang, incl Python; distrib prog; ntwrk protocols, incl TCP/IP & HTTPS & serialization schemes, incl protocol buffers
#1615.4831 C & C++, MapReduce, mach learn, distrib syst, data mine, design algorithms, HTTP & computer infrastruct
#1615.4089 design, implement, integrate, deployment, oper, maint & diagnosis of syst issues across large distrib web-based srvcs; prog & debug in Java, design & dvlpmnt of large syst sw & dvlpmnt, test, & enhancement of prod or syst utilities
#1615.3343 C or C++, syst prog, multithread, CPU arch, Python, large-scale distrib syst, & parallel & distrib computing
#1615.2578 C++, Java & Linux; web standards & protocols; design of complex web appl & web srvcs; design of algorithms; design & analysis of distrib syst, & design patterns, unit test, & continuous integration
#1615.3417 C++, Java, & Jscript, Unix & GNU toolchain, QA & testing, oo technologies, data struct & storage tech, info retrieval & data mine, algorithm dvlpmnt & implement, & UI design & implement
#1615.3595 C++, Python & Java; Linux syst admin & shell script; remote mgmnt & access & syst internals; adv algorithms & data struct; distrib syst & sw design
#1615.4167 C++, STL, Java & Python, channel coding & ntwrk coding tech, ntwrk syst design & multi-thread prog, ntwrk protocols & data transmission, distrib computing syst & algorithms, data struct & oper syst internals

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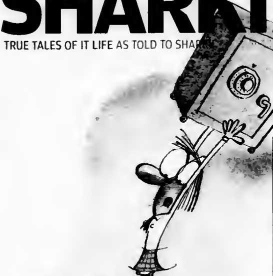
SW Engineer Position (Santa Monica, CA) Design, develop, modify, and/or test sw needed for various Google projects. Exp incl:
#1615.1634 large scale syst design, C, C++, Java or Python, dvlpmnt, testing & enhancement of prod &/or syst utilities; data struct, algorithms & sw design, database design, SQL, &/or TCP & IP & ntwrk prog, & HTML standards

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
SW Eng Position (Cambridge, MA) #1615.3413 C++ & Python; IP & implementation & dvlpmnt & deployment of scalable, parallel & multithread sw

SHARKTANK

TRUE TALES OF IT LIFE AS TOLD TO SHARKY



How Could *That* Happen?

It's the 1980s, and this IT pilot fish is in an Army unit that uses some early PCs for word processing. "Each officer had one. They had 10MB removable hard drives, which had to be secured in a safe at night," fish says. The officers would give the hard drive to a clerk typist, so he could type up letters and store them. But because the officers enjoyed harassing the clerk typists, they would occasionally drop the hard drives on the concrete floor – by accident, of course. "Sometimes several times. Sometimes launched at high speed, multiple times, over several days. Occasionally, officers would complain about their hard drives not working anymore. I can't imagine why."

Someone Will Pay

Head of plant engineering hires a maintenance superintendent – and everyone else soon regrets his choice. "Within weeks, the new guy has established himself as a wingnut, making bad decisions and exhibiting an obnoxious personality," reports a pilot fish. When Mr. Obnoxious manages to post a confidential document containing the salaries of his direct reports on a public share of the network, it's soon spotted by some of the hourly workers, and for the next week there's plenty of snickering over how much the company believes those supervisors are worth. And what does upper management finally do about the situation? "The misfit was told to be more careful," fish says. "Then the hourlies had their computer access revoked, except for a few who were tasked with maintaining preventive maintenance forms and the like. This adversely affected me as an intranet developer, because now email could no longer be used as a communication tool among the maintenance personnel. But at least the plant engineer didn't look foolish for having to fire his hand-picked subordinate."

Must Be the CFO

Help desk pilot fish gets a call from a user: "How much does a Print Screen button cost?" Why do you need a Print Screen button? puzzled fish asks. "I pushed my keyboard in, and a metal piece on the underside of my desk popped off the Print Screen button," user replies. "So how much does a Print Screen button cost?" We have new keyboards, fish sighs. We can send one over to you. A few minutes later, fish gets another call from the same user: "I found my Print Screen button. It was in the plant behind me. I don't need a new keyboard anymore."

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BPA Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement PM40063731. **CANADIAN POSTMASTER:** Please return undeliverable copy to PO Box 1632, Windsor, Ontario N9A 7C9. Computerworld (ISSN 0010-4841) is published twice monthly except for the month of July by Computerworld Inc., 492 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171.

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OPINION

THORNTON A. MAY

IT Must Prepare for The Internet of Things

N 1998, at the conclusion of the CIO Leadership Development classes I taught at UCLA and UC Berkeley, we asked the attendees to complete the sentence, "15 years from now . . ." Serendipitously, 15 years later, I came across a file folder with the responses.

My prediction? Connectedness will become an important metric in the next three to five years.

I was pleasantly surprised that several executives, citing the doubling of computer power every 18 months, storage capacity every 12 months and bandwidth throughput every nine months, had proclaimed unabashedly that in 15 years every molecule on this planet would he IP-addressable. They had, *to the year*, predicted the Internet of Things — a time when any real-world object can he discovered and queried.

The fact that they nailed the forecast is interesting but not the main issue here. Humans quite probably have been making predictions since the invention of language. We make so many of them that we are bound to get some of them right — and do so far more often than those proverbial millions of monkeys banging on millions of typewriters (shouldn't we have upgraded them to iPads by now?) will output *Hamlet*.

I have no doubt that in a drawer somewhere you could find a white paper or a science fiction story predicting precisely what will happen over the next 50 to 100 years. No, the important and actionable point here is that, when it comes to the Internet of Things, the days of prediction are behind us. The days of preparation and exploitation are upon us.

A few weeks ago, the IT Leadership Academy took the pulse of a few dozen CIOs regarding the state of the Internet of Things. Unsurprisingly, every one of them said they were pretty sure that somewhere in their enterprise someone was "linking things," or at least "thinking about linking things." But less than 2% of them had a strategy in place to fully exploit the emerging connectability associated with the Internet of Things.

My own prediction? Connectedness will become an important metric in the next three to five years. Individuals, products, services and institutions will be evaluated on how connected they are and on the value that accrues from those connections.

As a futurist, I am obligated to attempt to identify inflection points — things that fundamentally disrupt the status quo, change the competitive dynamic, call into question existing practices and require a general cognitive reboot. So here it is: This is one of those.

But that was easy. Here's a less obvious prophecy: Refreshingly, this highly significant and high-impact change in the technology industry will first come to fruition not in the much-talked-about precincts of consumerization but in the frequently overlooked and mistakenly left-for-dead manufacturing sector. One scenario posits a disruption of the entire industrial economy. It is very plausible that in the future, every high-value piece of equipment will he manufactured with embedded sensors, so that the critical piece-parts will be able to call for prophylactic maintenance when they sense that they are about to fail.

What does tbe Internet of Things mean for IT? What really happens wben things start to talk? What do you need to do to prepare? One CIO I interviewed lamented, "I can't get finance to talk to marketing or to product development, and now you want me to orchestrate a billion macbines gabbing to one another?"

Yes, that's the idea. This will be interesting. ◆

Thornton A. May is author of *The New Know: Innovation Powered by Analytics* and executive director of the IT Leadership Academy at Florida State College in Jacksonville. You can contact him at thorntonamay@aol.com or follow him on Twitter (@deanitla).

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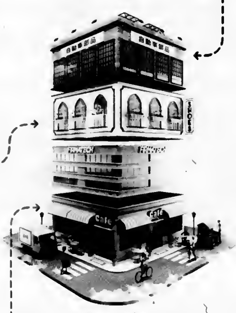

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